

REMARKS

The Examiner has rejected claims 1-4, and 6-20 as unpatentable under 35 U.S.C. §103(a) over Pellin, U.S. Patent No. 4,102,654, in view of Liedbeskind et al, U.S. Patent No. 6,632,805, and in further view of Doushita et al., U.S. Patent No. 6,576,344. The Applicant and their attorneys have carefully considered the rejection and respectfully disagree.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Last, the prior art references, when combined, must teach or suggest all the claim limitations. *In re Vaeck*, 947 F2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

The initial burden is on the Examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliably suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. & Inter. 1985). Applicant respectfully submits that, in the instant case, the Examiner has failed to meet this burden, for reasons set forth hereinbelow.

The '654 patent teaches an ionizer that comprises a dry filter 4, a wet filter 5, a fan 6, a positively charged grid 7, a negatively charged grid 8, a negatively charged venturi 9 and a germicidal tube 10 that generates shortwave ultraviolet radiation.¹ Wet filter 5 may be impregnated with a bactericidal or deodorizing liquid.²

¹Col. 2, lines 28-57.

²Col. 2, lines 32-33.

The Examiner recognized that the '654 patent does not teach or suggest coating the surfaces or filters of the ionizer with a non-volatile antimicrobial agent. Thus, the Examiner relies upon the '805 patent.

The '805 patent teaches water-stable organosilane compounds that can be used to treat various substrates.³ A wide variety of surfaces can be treated with the organosilane compounds, including air filters,⁴ and HVAC systems.⁵ The organosilane coatings are applied to substrates such as air filters and the like, the substrate is then dried to remove excess solution.⁶ The '805 patent does not teach or suggest that the organosilane coating can be used as a liquid coating on a wet filter in the manner required by the '654 patent.

The Examiner combines the '654 patent with the '805 patent, and states that it would have been obvious to substitute the antimicrobial agent of the '654 patent by the antimicrobial agent of the '805 patent. However, since the Examiner has failed to point to any motivation or suggestion in the references to make the modification, *i.e.* replace a wet, liquid antimicrobial with a dried, solid coating, the '805 patent and the '654 patent are not properly combinable. This is especially true inasmuch as the ionizer of the '654 patent already contains a dry filter.

Not only is motivation or suggestion to combine these references completely lacking in the prior art, but the combination goes against the express teachings of the references. The '654 patent teaches that the antimicrobial agent is a liquid. The '805 patent teaches that the antimicrobial agent is dried.

It is well established that a combination is not obvious if it would change the principle of operation of the prior art invention being modified. *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (CCPA 1959). Applicant maintains that the modification described by the Examiner would change the principle of operation of the ionizer of the '654 patent. The principle of operation should not be confused with a suggested purpose. While a purpose

³'805 patent, Col. 1, lines 8-11.

⁴'805 patent, Col. 33, lines 14-34.

⁵'805 patent, Col. 36, lines 32-35.

⁶'805 patent, Col. 33, line 50, Examples VI and VII.

of the wet filter of the '654 patent may relate to bacteria, the method of operation requires that the filter is wet. This method of operation would be drastically altered by drying it.

Thus, the '654 and '805 patents are not properly combinable. There is no teaching or suggestion found in the prior art or general knowledge in the field to combine them. Furthermore, the references teach away from such a combination, and the combination would alter the principle of operation. Applicant therefore respectfully submits that a *prima facie* case of obviousness has not been established as to the '654 and '805 references.

Even if combined, the '654 and '805 patents do not teach or suggest the invention of claims 1-4 and 6-20. The Examiner acknowledges that the '654 and '805 patents do not teach coating surfaces of the ionizer with a non-volatile antimicrobial agent. Therefore, the Examiner relies upon the further combination of the '654 and '805 patents with the '344 patent to Doushita et al. The Examiner states that it would have been obvious to one of ordinary skill in the art to coat one or more surfaces of the ionizer apparatus of the '654 patent with a coating described in the '344 patent by Doushita et al. However, Applicant respectfully submits that the '344 patent is not analogous art and thus is not properly relied upon in a rejection of the instant claims.

In order to rely upon a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor, or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned. M.P.E.P. 2141.01(a) (citing *In re Oetiker*, 977 F.2d 1443, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992)).

The '344 patent teaches an anti-fogging, anti-soiling film that may be applied to a surface such as window glass for automobiles and buildings, mirrors, and optical parts.⁷ The '344 patent is therefore non-analogous art to Applicant's invention, in that it does not relate to an apparatus or method for purifying air. The '344 patent is not in the field of applicant's endeavor (air purification systems) and is not at all pertinent to the problem with which Applicant is concerned (purifying air, including destroying microbes through the use of an antimicrobial substance). It is important to note that "anti-soiling" refers to a surface

⁷'344 patent, Col. 3, lines 2-7.

that repels dirt,⁸ and is not equivalent to “anti-microbial,” which means capable of destroying or inhibiting the growth of microorganisms.⁹ In fact, not only are the functions not analogous, but to an extent they are opposite. That is because, as one of skill in the art will recognize, in order for an antimicrobial to destroy particles, it must come into contact with them. An anti-soiling surface, however, prevents particles from coming into contact with the surface. It repels particles.

Further evidence that the ‘344 patent is non-analogous to Applicant’s invention is that the ‘344 patent does not fall within the same international patent classification scheme as the instant application.¹⁰

The ‘344 patent is also non-analogous art to the ‘654 patent, in that it does not relate to a negative ionizer. Therefore, the ‘344 patent is not properly combinable with the ‘654 patent in an analysis under 35 U.S.C. 103.

Even if the ‘344 is considered, it is not properly combined with the ‘654 and ‘805 patents, because there is no suggestion to combine them. The ‘344 patent does not teach, disclose, or suggest an air purifying apparatus having an ultraviolet radiation section, where one or more surfaces of the ultraviolet radiation section are coated with a non-volatile antimicrobial agent. The film can include an adhesion prevention layer that consists of silicon oxide.¹¹ The adhesion prevention layer may be formed by applying an organosilicon compound, either vapor or liquid, onto the photocatalyst layer of the film, and either heating the film or exposing the film to ultraviolet radiation in an oxygen atmosphere in order to decompose the organosilicon compound to form silicon oxide.¹² In other words, although an organosilicon compound may be used to form the adhesion prevention layer, the layer

⁸See, e.g. U.S. Pat. No. 6,818,717. See also, ‘344 patent, Col. 15, lines 53-59. This adhesion prevention layer does not give rise to chemical bonding with dirt components, and dirt tends not to become fixed to the surface

⁹See, e.g. <http://www.answers.com/topic/antimicrobial>.

¹⁰The ‘344 patent was classified as IC=B32/B 17/06; C04B 35/495. Applicant’s priority document, WO 02/04036 A1 was classified as IC=A61L 9/20.

¹¹‘344 patent, Col. 14, lines 41-54.

¹²‘344 patent, Col. 14, lines 57-66.

actually consists of silicon oxide. There is no teaching or suggestion that silicon oxide is antimicrobial. There is no teaching or suggestion that silicon oxide could be applied to a surface of an air purifier. There is no teaching or suggestion that the organosilicon compound is antimicrobial. There is no teaching or suggestion that the organosilicon compound can be a quaternary amine in a silane. There is no teaching or suggestion that the organosilicon compound can be 3-(trimethoxysilyl)-propyl dimethyloctadecyl ammonium chloride.

In addition, there is no motivation found in either the '344 or the '654 patent to include a coating of SiO_x on the surface of the radiation section of the apparatus of the '654 patent. A close reading of the '654 patent by one of skill in the art would reveal that it doesn't make sense to coat any of the ionizer surfaces with the SiO_x coating of the '344 patent. While the SiO_x coating of the '344 patent repels dirt particles, the grids 7 and 8 of the ionizer are electrically charged to attract particles.¹³ Tube 10 of the ionizer may be made out of silica,¹⁴ and therefore there would be no reason to coat it with the same through the elaborate and expensive scheme of starting with an organosilane as described in the '344 patent. The negatively charged surface of Venturi 9 of the ionizer is made of metal that is polished to be reflective,¹⁵ and therefore it would not make sense to coat it with the non-metallic SiO_x coating of the '344 patent, especially when SiO_x is known in the art to be a semi-conductor and therefore would not easily hold a negative charge. Furthermore, there is no suggestion in the prior art references that SiO_x is either bactericidal or deodorizing.

Even if the cited references are combined, they do not teach every limitation of the subject claims, because none of the cited references teach or suggest an air purifying apparatus having an ultraviolet radiation section, where one or more surfaces of the ultraviolet radiation section are coated with a non-volatile antimicrobial agent. The Examiner acknowledges that the '654 and '805 patents do not teach a non-volatile antimicrobial coating on one or more internal surfaces of an ultraviolet radiation section of an air purifier. As stated above, the '344 patent does not relate to an air purifier, and does not teach a non-volatile antimicrobial agent. As such, it is respectfully submitted that a

¹³'654 patent, Col. 2, lines 37-46.

¹⁴'654 patent, Col. 2, line 56.

¹⁵'654 patent, Col. 3, lines 1-4.

prima facie case of obviousness has not been made. Applicant therefore respectfully requests that the Examiner withdraw the rejection under 35 U.S.C. § 103.

With respect to claims 2-3, 7-8 and 15-18, these claims are dependent upon independent claims 1, 6, and 14, respectively, and therefore include all of the limitations thereof. Therefore, Applicant reiterates that, even if the cited references are combined, they do not teach every limitation of the subject claims, because none of the cited references teach or suggest an air purifying apparatus having an ultraviolet radiation section, where one or more surfaces of the ultraviolet radiation section are coated with a non-volatile antimicrobial agent.

With respect to claims 4, 9-13, and 19-20, these claims are dependent upon independent claims 1, 6, and 14, respectively, and therefore include all of the limitations thereof. Therefore, Applicant reiterates that there is no suggestion or motivation found in the prior art to modify the ionizer of the '654 patent in the manner necessary to achieve the claimed invention. For example, there is no suggestion to employ an antimicrobial agent that is a quaternary amine in a silane as a non-volatile coating on one or more surfaces of the ionizer. Furthermore, even if the cited references are combined, they do not teach every limitation of the subject claims, because none of the cited references teach or suggest an air purifying apparatus having an ultraviolet radiation section, where one or more surfaces of the ultraviolet radiation section are coated with a non-volatile antimicrobial agent.

CONCLUSION

In view of the foregoing arguments presented herein, Applicant believes that the invention is properly set forth and accordingly, respectfully requests the Examiner to reconsider and withdraw the rejections provided in the last Office Action. A formal Notice of Allowance of claims 1-4 and 6-20 is earnestly solicited.

In the event an additional fee is required with the filing of this Amendment, the Commissioner of Patents and Trademarks is hereby authorized to withdraw the required funds from Deposit Account No. 18-0987. If a withdrawal is required from Deposit Account No. 18-0987, the undersigned attorney respectfully requests that the Commissioner of Patents and Trademarks cite Attorney Docket Number THC.P0003 for billing purposes.

Application No.: 10/070,721
Response to Office Action of 04-29-05
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Should the Examiner deem a telephone call to be beneficial in resolving any remaining matters or to place the claims in better form for allowance, the same would be greatly appreciated.

Respectfully submitted,



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